

Wildlife Management and Conservation Plan for Construction of Kotdwar Bypass of NH-119 Connecting Najibabad –Kotdwar to Kotdwar-Pauri Road in the state of Uttar Pradesh and Uttarakhand under Bharatmala Pariyojana Lot-4/PKG-2

Length of the project – 5.95 Km

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Brief of the Project

1. General

The Ministry of Road Transport and Highways (MORTH), Government of India has proposed "Bharatmala Pariyojana" an Umbrella scheme of road development project through National Highways Authority of India (NHAI), National Highway, Industrial Development Corporation Ltd (NHIDCL) and State Public Works Departments (PWD) at an estimated cost of INR 5,35,000crores. This is the second largest highways construction project in the country after NHDP, where in almost 83,677 km of roads are targeted across the country. This project aims to improve connectivity particularly on economic corridors, border areas and to remote areas with an aim of rapid and safe movement of cargo to boost exports. International trade considered as a key aspect in this scheme and North-eastern states have been given special focus.

The project was cleared by the Union Cabinet on October 25, 2017. The ambitious project expected to create nearly 100 million man days of jobs during the construction and subsequently to about 22million jobs of the increased economic activity across the country. The construction will be carried out through many means including debt funds, budgetary allocation, private investment, toll operator transfer etc. The total length of around 48,877 km considered in phase 2 including

- Economic corridors of around 15,000 km,
- Inter-corridor and feeder route of around 9,500 km,
- Border and international connectivity roads of around 3,300 km,
- Expressways of around 800 km
- NHDP roads of 10,000 km.

MoRTH has concluded the Bharatmal Pariyojana vide Office Memorandum RW/NH-24036/95/2024-BP&SP dated 08.08.2024, wherein funding of the balance project under the above mentioned pariyojana will be take up case to case basis under the different head, mention circular language.

SA Infrastructure Consultant Pvt. Ltd. 1101A, 11th floor, Tower A-II, Corporate park, Plot no. 7A/1, Sector-142, Noida, UP has been appointed as consultant to carry out Consultancy Services for Preparation of DPR for development of Economic Corridor, Inter Corridors and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojana (Lot-4/Package-2) section in the state of Uttar Pradesh and Uttarakhand,

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Construction of 4 – laning of Kotdwar Bypass of NH – 119 connecting Najibabad-kotdwar to Kotdwar - Pauri road in the State of Uttar Pradesh and Uttarakhand.

2. Introduction

Construction of 4 – laning of Kotdwar Bypass of NH – 119 connecting Najibabad-kotdwar to Kotdwar-Pauri road passing through Greenfield and Built-up area in the state of Uttar Pradesh and Uttarakhand. Alignment passing through Villages Kouriya, Telipara, Kashi Rampur-Sukhro, Nathupur, Vishanpur-Saneh, Jeetpur-Saneh Ratanpur, Grashtin Ganj-Saneh, Kotdwar Gaon- Saneh. Latitude and longitude of the project corridor lies between 28°47'39.02"N to 78°58'4.36"E and 28°49'20.57"N to 79° 4'21.63"E.

3. Description of Forest Land

The entire area of Najibabad Forest Division is reserved forest. The reserved forest area borders the forest areas of the state of Uttarakhand in north and west. The region primarily consists of plains but because of its location at foothills of Shivalik range, some parts are of uneven terrain. The soil in the area is alluvial and fertile. The remaining part of the forest is characterized by Terai-Bhabar landscape, making it a diverse ecosystem.

Wild animals such as tigers, leopards, elephants, chital, sambar, nilgai, wild boar, etc. can be found in this forest.

Elephants and other wildlife frequently migrate between the forests of Uttarakhand and this region. Due to this connectivity, Government of India has designated this forest area as a part of 'Project Elephant'.

From management perspective, the forest has been divided into five ranges, with 36 beats. This area is highly sensitive due to population pressure of surrounding human habitation. The primary tree species in this region include sal, teak, shisham, khair, and various fruit-bearing trees like ber, amla, jamun, anjeer, amaltas, bel, peepal, etc. Additionally, essential tree species like harad, baheda, and other medicinal plants are also found in significant numbers. Among all forest regions in the state, this forest has the highest number of wild elephants. Many villages are located near forest areas. The presence of cultivated land along the borders of forest areas makes it very sensitive to human-wildlife conflict.

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4. Finalization of proposed Alignment

The proposed alignment choosen considering bare minimum impact on flora and fauna in and around the project corridor.

- ✓ Major habitation and major settlement area avoided
- ✓ Minimum route length
- ✓ No wildlife sanctuary / Biosphere/ Protected Areas, etc. avoided
- ✓ Least forest involvement
- ✓ Higher density tree patches avoided
- ✓ Minimum Vegetation / tree cutting in the route of the proposed bypass
- ✓ Archeological Structures, defense sites, airport area etc. are avoided
- ✓ Rich gardens, plantations, notified industrial area, etc. to be avoided
- ✓ No involvement of temples/ Cultural Habitats/ Schools & colleges.
- ✓ Road connectivity to project sites to avoid construction of temp roads
- ✓ No involvement of Industrial corridor
- ✓ Minimum no. of River Crossings, Railway Crossings, Highway Crossings, Power Line Crossings are considered
- ✓ Economic viability of the route

5. Existing Carriageway and Pavement Details

The existing carriageway is intermediate lane with ROW 10-12 mtr. with hair-pin bend in Kotdwar City Area and also passes through thickly populated built up area. The improvement of existing road to Four lane road of NH standard is not viable considering IRC guidelines and MoRTH circulars as well as major social issue. NHAI proposed for bypass to avoid all the built-up area as well as the good number of trees on the either side of existing road for development of four lane of Kotdwar bypass (Design Ch 0+00 to 5+95 Km) ends at Tilwad Dhang in Kotdwar at Ch. 5+95 connecting Najibabad-Kotdwar to Kotdwar-Pauri road (NH-534). Wherein NHAI design for roundabout at the Kotdwar-Pauri road (NH-534) Ch. 5+95.

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Fig-01 Key Map

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6. Settlements

The details of settlements along with the project road are given below in Table 1.1.

Table 1.1 Details of Settlements

S. No.	Name of Settlements
1.	Kouriya
2.	Ratanpur
3.	Harsinghpur
4.	Kashirampur
5.	Ganesh Vihar colony
6.	Vikas Nagar

7. Details of Elevated structure of the Proposed Highway for the safe passage of animals

S. No.	Chainage		Length (m)	Vertical Clearance (m)	Remark
	From Km	To Km			
1.	0.989	1.405	416	8 to 10 m	Left Side Loop
2.	0.000	0.191	191		Carriage Way
3.	0.665	0.735	70		Carriage Way
4.	1.130	1.460	330		Carriage Way
5.	1.880	2.450	570		Carriage Way
6.	3.910	5.880	1970		Carriage Way
7.	Total	-	3547		

8. Structure Details

There are several structures along the project road. The details are given in table below:

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(i) Major Bridges

Details of Major Bridges

S. No.	Design Chainage (km)	Span Arrangement c/c Expansion (m)	Type of Structure	Deck Configuration (m)
1	0+973 to 1+393	14x30	Major Bridge cum Viaduct	2x11
2	3+910 to 5+880	46x30+1x40+16x30+2x20+1x30	Elevated Section cum MJB	2x11

(ii) Minor Bridges

Minor Bridge

S. No.	Design Ch.	Structure Type	Existing Span	Proposed Span	Reconstruction/ Proposed
NIL					

(iii) Minor Bridge cum Underpass

Minor Bridge cum Underpass

S. No.	Design Ch.	Structure Type	Existing Span	Proposed Span	Reconstruction/ Proposed
NIL					

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(iv) VUP (Vehicular Under Pass)

Vehicular Under Pass at MCW

S. No.	Design Chainage (km)	Structure Type	Proposal	Span Arrangement (Clear opening) (m)	Vertical Clearance (m)	Deck Configuration (m)	Approx. Skew Angle
NIL							

(v) LVUP (Light Vehicular Under Pass)

Details of Light Vehicular Under Pass

S. No.	Design Chainage (km)	Structure Type	Proposal	Span Arrangement (Clear opening) (m)	Vertical Clearance (m)	Deck Configuration (m)	Approx. Skew Angle
NIL							

(vi) SVUP (Small Vehicular Under Pass)

Details of Small Vehicular Under Pass

S. No.	Design Chainage (km)	Structure Type	Proposal	Span Arrangement (Clear opening) (m)	Vertical Clearance (m)	Deck Configuration (m)	Approx. Skew Angle
NIL							

(vii) Fly-Over

Details of Fly-Over

S. No.	Design Chainage (km)	Proposal	Span Arrangement c/c Expansion (m)	Vertical Clearance (m)	Deck Configuration (m)
1	0+715	New construction	2x35	5.5	2X11

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(viii) Details of Elevated Structure/Viaduct

Details of Elevated Structure

S. No.	Design Chainage (Km) of Main Carriageway /loop/ramp	STRUCTURE	Span Arrangement (Clear opening) (m)	Deck Configuration (m)	Vertical Clearance (m)
1.	LHS Loop (+989 to 1+404.80) Interchange at 0+000	Elevated section	12x30+1x27+1x28.8 0	1x11(Viaduct)	As per GAD
2.	RHS Loop (0+818 to 1+285) Interchange at 0+000	Elevated section	13x30+1x18+1x27+1 x32	1x11(Viaduct)	As per GAD
3.	MCW (0+037.20 to 0+191.70)	Elevated section	3X30+1x33+1x36.3	2x11	As per GAD
4.	LHS Loop(0+390 to 0+510) Interchange at 0+700	Elevated section	4x30	As per GAD	As per GAD
5.	RHS Loop(0+320 to 0+440) Interchange at 0+700	Elevated section	4x30	As per GAD	As per GAD
6.	0+973 to	Major	14x30	2x11	As per

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	1+393	Bridge Cum Viaduct			GAD
7.	1+910 to 2+480	Elevated Section	19x30	2x11	As per GAD
8	3+910 to 5+880	Elevated Section Cum MJB	46x30+1x40+16x30+2x20+1x30	2x11	As per GAD

(ix) Road Over Bridge

Details of R.O.B

S. No.	Design Chainage (km)	STRUCTURE	Span Arrangement (Clear opening) (m)	Vertical Clearance (m)	Deck Configuration (m)	Skew Angle
1.	0+000 to 0+037.20(MCW)	Composite I Girder	1x37.2	5.5	2x12.3	19

(x) Culverts

Details of the Culverts

S. No.	Design Chainage (Km)	Type of Culvert	Size No x Width (m) x Height (m)	Remark
1.	0+950	Box Culvert	1x6x4	New Proposed
2.	1+477	Box Culvert	1x3x3	New Proposed
3.	1+510	Box Culvert	1x4x4	New Proposed

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4.	1+530	Box Culvert	1x3x3	New Proposed
5.	1+570	Box Culvert	1x3x3	New Proposed
6.	1+630	Box Culvert	1x4x4	New Proposed
7.	1+700	Box Culvert	1x6x4	New Proposed
8.	1+780	Box Culvert	1x4x3	New Proposed
9.	1+803	Box Culvert	1x3x3	New Proposed
10.	2+557	Pipe Culvert	1.2 m Dia	New Proposed
11.	2+677	Box Culvert	1x3x3	New Proposed
12.	2+942	Pipe Culvert	1.2 m Dia	New Proposed
13.	3+190	Pipe Culvert	1.2 m Dia	New Proposed
14.	3+325	Pipe Culvert	1.2 m Dia	New Proposed
15.	3+560	Pipe Culvert	1.2 m Dia	New Proposed
16.	3+690	Box Culvert	1x3x3	New Proposed
17.	3+880	Box Culvert	1x3x3	New Proposed

Note:

- The light and sound barrier will be provided on the structure including their slopes. There is also provision of the crash barrier at the toe of the carriageway wherein light and sound barrier will be fixed.
- The minimum width of the above culverts shall be equal to Roadway width (including median) In case of connecting road culvert also to be provided in the gap between main carriageways& connecting road. In cases of the culverts with fill culvert to be provided

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Length of the project – 5.95 Km

though out Roadway width and median width. Any additional length required as per site conditions shall not constitute a Change of Scope.

- Ventway/Span arrangements are minimum specified based on detailed Geo-Hydrological studies and traffic including pedestrian survey.
- The all precast structures will be assembled at the project site in forest area to avoid any impact on fauna in and around project corridor.
- Invert level of box culverts (without defined channel or flow) shall not be lower than the existing Ground level for ease of movement of wild life.

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Details of Forest Land Proposed for Diversion

S. No.	Name of Division	Name of Tehsil /Taluk	Name of Village	Name of Reach/ Canal/ Road/ Crossings	Ch. From (Km)	Ch. To (Km)	Area (Sqm.) LHS		Area (Sqm.) RHS		Forest Area Proposed for Diversion (sqm.)	Forest Area Proposed for Diversion (ha)	Compartment No./ Reach Name	Legal Status of Forest Area
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Social Forestry Division Bijnor	Najibabad	Kauriya	Najibabad Kotdwar Existing Highway	0+000	1+000					5000	0.50	Road Side	Protected Forest
2					1+100	1+200					600	0.06	Road Side	
3					Northern Railway NBD-KTW	1+200	1+260				950	0.10	Railway Line Side	
4	Forest Division Najibabad			Kauriya RF Dense Jungle	0+000	0+260	Area of polygons measured and calculated through Google Earth and Auto Cadd Software's			26000	2.60	RF (14, 16) Compartment	Reserve Forest	
5				Kauriya RF Dense Jungle	0+000	0+740					20100	2.01		RF (22, 24 & 26) Compartment
6					Total Protected Forest Land (A)					6600	0.66			
					Total Reserve Forest Land (B)					46100	4.61			
					Total Forest Land (A+B)					52700	5.27			

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Length of the project – 5.95 Km

Cost Estimate

Total Project Cost			
S. No.	Description of Item	Amount (Rs. in Crore)	Cost (%)
1	Site Clearance	0.02	0.00%
2	Earth Work	8.44	2.30%
4	Non-Bituminous Courses	8.08	2.20%
5	Bituminous Courses	8.56	2.33%
6	Elevated Sections	40.44	11.02%
7	Elevated Sections Cum MJB	148.38	40.42%
7	Flyover/Interchnage/Loop	5.08	1.38%
8	Elevated Sections Cum ROB-1	49.23	13.41%
9	MJB cum Viaduct	37.17	10.13%
10	RE Wall	33.99	9.26%
11	Drainage and Protective Works	19.22	5.23%
12	Junctions	6.66	1.81%
13	Traffic Signs, Marking and Road Appurtenances	1.66	0.45%
14	Miscellaneous works	0.10	0.03%
15	Highway Lighting	0.08	0.02%
A	Civil Construction Cost	367.10	100.00%
B	Utility Shifting Cost	7.37	
C	Total Civil cost incl. Utility Shifting Cost	374.47	
D	GST Charge 18% on (A)	66.08	
E	Contingency @1% on (A)	3.67	
F	Supervision Consultancy charges @3% on (A)	11.01	
G	Escalation @5% per year, i.e., 7.5% for 1.5 years on (A)	27.53	
H	Maintenance charges @2.5% for 5 Years on A	9.18	
I	Total Civil Cost incl. GST & Centages	491.94	
J	Forest Clearance/Tree Cutting	6.80	
K	Land Acquisition Cost (Tentative)	189.70	
L	Total (C+D)	196.50	
M	Total Project Cost (Including LA and FC)	688.437	
Civil Cost per Km. (A/5.950 Km)		61.70	
Total Project Cost per Km. (M/5.950 Km)		115.70	
Civil cost as per LoA issued to the Contractor		382.78 Cr.	

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Length of the project – 5.95 Km

Impacts of the Proposed Project

1. Positive Impacts

- The project with new alignment is the best option which has been envisaged through an area which shall have the advantage of simultaneous development as well as shall result in a shorter distance to travel.
- The junctions with existing road will be planned in the form of interchanges and flyover to ensure uninterrupted flow of traffic.
- The proposed road would act as the prime artery for the economic flow to this region. It will enhance economic development, provide employment opportunities to locals, strengthen tourist development, ensure road safety, and provide better transportation facilities and other facilities such as way side amenities.
- Vehicle operating cost will also be reduced due to improved road quality.

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Details of off-site Wildlife Conservation Plan (Implementation by the Forest Department)

(1) Hanging Solar Fence

Area proposed for the project by the user agency is part of "Project Elephant". The proposed project is linear infrastructure which lies inside the elephant corridor. Hence user agency should provide for installation of hanging solar fence at border of forest and agricultural fields in sensitive areas to mitigate any potential damage caused by human-elephant conflict.

(2) Watch Towers

The proposed project site has an abundance of wildlife including elephant, leopard, jackal, chital deer, etc. This area is an essential part of wildlife corridor connecting Jim Corbet National Park to Rajaji National Park. For this, watch towers are needed for front line staff for effective monitoring and patrolling. User Agency should also provide lumpsum amount for construction of guardroom adjoining the watchtower for 24 hours round the clock patrolling.

(3) Fire Protection Measures

Climatic, topographic and anthropogenic factors put forest in proposed project area at high risk of fires. Hence, the user agency should provide firefighting equipment including leaf blowers, fire balls and other safety equipment as well as for maintenance of existing fire lines.

(4) Water Holes

Proposed project area is part of 'Project Elephant' programme and is dominated by elephant presence and movement. During dry seasons, naturally occurring water reservoirs inside forest dry up, forcing elephants and other wild animals to move outside forest area. Hence it is proposed that pucca water holes be constructed in strategic locations. This will provide for the water requirements of wild animals and will help in mitigating potential human wildlife conflict.

(5) Equipment for Rescue and Rehabilitation of Wild Animals

Equipment such as trapping cages, transport cages, squeeze cages, stretchers and other necessary equipment for rescue and rehabilitation of rescued animals should be provided by the user agency.

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(6) Patrolling and Maintenance

NHAI should provide lumpsum amount for effective monitoring of wildlife movement and anthropogenic influences regarding intensive patrolling in the forest area for 5 years from the date of commencement of work.

(7) Veterinary Care

The user agency should provide one time fund for purchase of essential medical supplies and veterinary care of wild animals.

(8) Signage Boards

The user agency should provide the lumpsum amount for the signage boards indicating movement of wild animals and other important information in forest area. These signage boards should be of high quality and durability to withstand harsh forest conditions.

(9) Wildlife Deterrent Equipment

The proposed project site is surrounded by human habitations and agriculture land. Proposed linear infrastructure project will affect the natural movement of wild animals which may increase in risk of human-wildlife conflict. Hence, the user agency should provide lumpsum amount for purchasing deterrent devices like aniders, fox light, etc. This is essential in mitigating human- wildlife conflict.

(10) Soil and Moisture Conservation Works

There is intricate network of rivers inside the reserve forest area. There is a heavy dependence of wild animals on drainage basins and watershed of these fluvial landforms. There is a strong possibility of erosion and diversion in the project areas. Hence, the user agency should provide lumpsum amount for creation of water conservation structures in the area including gabion check dams and kuccha water holes in the strategic locations.

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Budget and Type of Work Proposed under Wildlife Mitigation Plan

Sr. No.	Proposed Work	Physical Target	Financial Target (Lakh rupees)
1.	Hanging Solar Fence	15 km	45
2.	Watch Towers including construction of Guard Room	2	40
3.	Fire Protection Measures	lumpsum	10
4.	Water Holes	10	20
5.	Equipment for Rescue and Rehabilitation of Wild Animals	lumpsum	10
6.	Patrolling and Maintenance	lumpsum	Year 1: 5 Year 2: 5 Year 3: 5 Year 4: 5 Year 5: 5 Total: 25
7.	Veterinary Care	lumpsum	5
8.	Signage Boards	lumpsum	5
9.	Wildlife Deterrent Equipment	lumpsum	5
10.	Soil and Moisture Conservation Works	lumpsum	15
		SUM	180

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